

transcell[®]



Signal Link

MULTI-FUNCTION SIGNAL CONDITIONER

User Manual

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The SIGNAL LINK multi-function signal conditioner is a compact, modular electronic device designed to snap onto standard 35mm DIN rails inside control panels. It converts mV/V sensor input signals into standardized analog outputs (e.g., 4–20mA, 0–10V) for remote monitoring and control.

The SIGNAL LINK also provides RS485 and USB output communication as well as relay output control. Up to eight (8) 350R resistance strain gauge load cells (or other sensors) can be connected to the input circuit.

The product can be used in industrial control applications such as filling systems, weighing hopper systems, mixing systems, electronic belt scale systems, etc.

BEFORE YOU BEGIN

Before operating this unit, please read these instructions completely and carefully before use. Manuals and additional resources are available from our website, or you can scan the QR code on the front panel.

THIS MANUAL COVERS THE FOLLOWING PRODUCTS

Model	Excitation Voltage	ADC Sampling Rate	Benefit
SIGNAL LINK-AD09	DC 5V square wave	10Hz, 20Hz, 50Hz, 60Hz, 100Hz, 400Hz, 1200Hz, 2400Hz, 4800Hz, 7200Hz	High Speed ADC

INSTALLATION & CONNECTIONS

	 WARNING 1. Testing, inspection, and maintenance of the system must be performed by qualified personnel only. 2. Please ensure the equipment is properly grounded.
---	---

 CAUTION	 CAUTION 1. Do not plug or unplug while energized. 2. Please disconnect the power supply before performing electrical connection or maintenance work.
---	--

Remember that the installer is ultimately responsible to assure that an installation will remain safe and operable under the specific conditions encountered. The signal conditioner must be properly configured and calibrated prior to use.

Mounting of Signal Link signal conditioner

This device was designed to be mounted onto a 35 mm DIN rail.

To install, hook the top edge of the device's mounting clip onto the top edge of the rail, then press or pivot the bottom downward until it clicks and locks into place. Ensure the device is securely locked by gently pulling it. Consider using end clips to stop lateral movement.

CONNECTIONS

CAUTION

Disconnect power source from signal conditioner prior to making any connections.

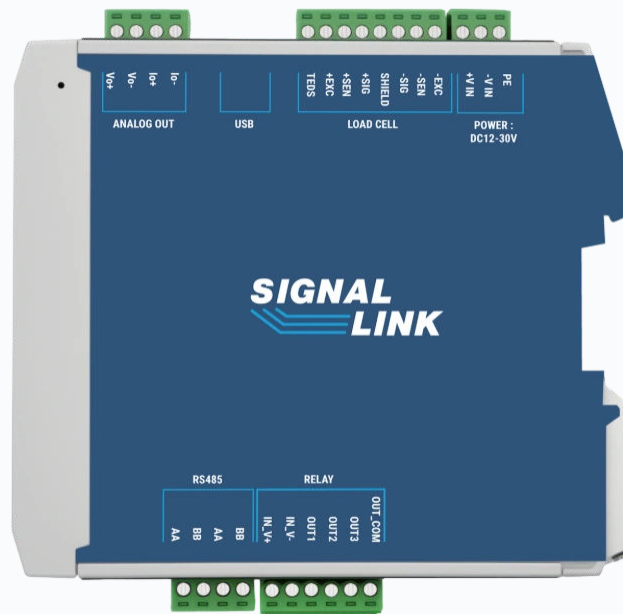
Except for the USB communication port, all connections are made via detachable screw terminal blocks. For convenience, a flat blade screwdriver tool is included with the signal conditioner. Ensure the power is off, strip the insulation (1/4" or 6–7mm), insert wires into the correct terminals, tighten securely, and check that no bare wire strands are touching.



Detachable screw terminal block



Included flat blade screwdriver tool



Wiring Connections on Right Face

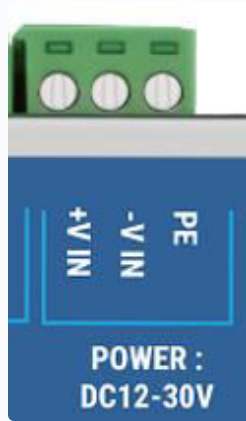
Power Terminal Block

Connect an external DC power supply (12–30V only) to the terminal block by matching polarity:

1. Connect positive (**+VIN**) to positive and negative (**-VIN**) to negative.

2. If required, connect the **PE** terminal to Ground.

Verify that the power supply connections are correct before powering on.



Power terminal block — DC 12–30V (+VIN, -VIN, PE)

LOAD CELL (SENSOR) INPUT TERMINAL BLOCK

The cable from the load cell(s) requires a shield which must be properly grounded to ensure maximum stability. Use of cable designed for mV/V signals is highly recommended. Be sure to route the load cell cable away from high voltage / power cables.

If the signal conditioner needs to be connected to multiple load cells, a junction box should be used. The junction box must be purchased separately.

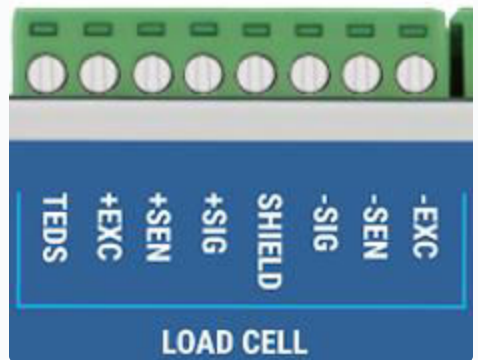
The maximum length allowed for the load cell or junction box cable is shown in the following table:

Connection	24 AWG	20 AWG	16 AWG
Connect to 1 × 350Ω load cell	200 m [656 ft]	300 m [984 ft]	400 m [1312 ft]
Connect to 3 × 350Ω load cells	60 m [197 ft]	150 m [492 ft]	200 m [656 ft]
Connect to 4 × 350Ω load cells	40 m [131 ft]	100 m [328 ft]	120 m [394 ft]

Connect your load cell or junction box cable to the load cell input terminal block using the table below.

Marking	Function	Marking	Function
TEDS	TBD	SHIELD	Shield

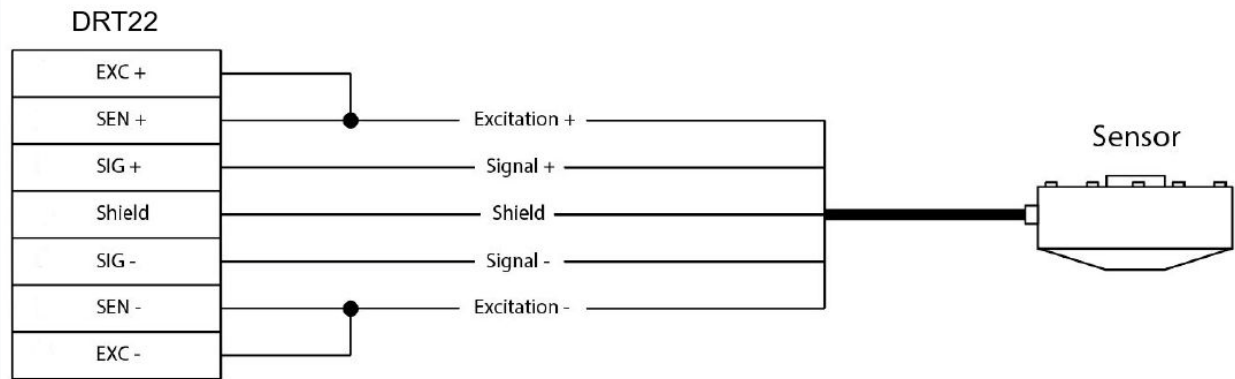
Marking	Function	Marking	Function
+EXC	+ Excitation	-SIG	- Signal
+SEN	+ Sense	-SEN	- Sense
+SIG	+ Signal	-EXC	- Excitation



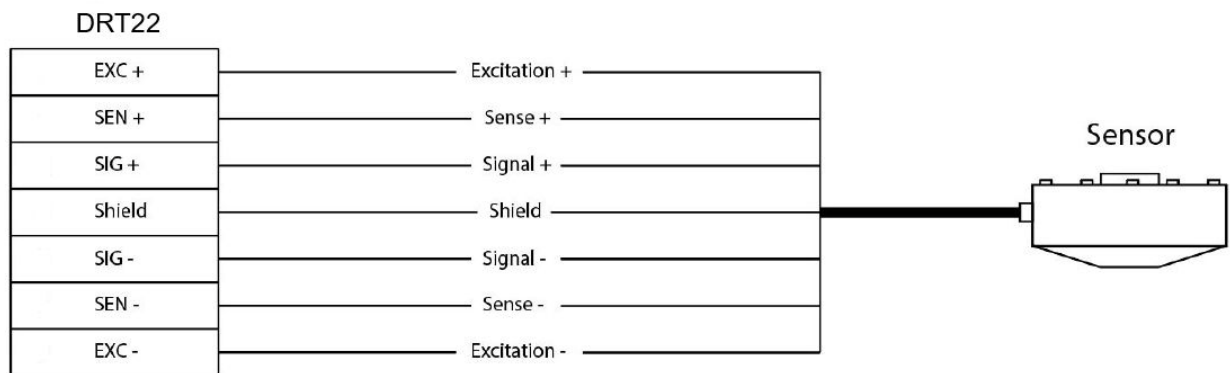
Load cell input terminal block

FOUR-WIRE CONNECTION

When using a 4-wire sensor, the **+EXC** and **+SEN** connections should be shorted together, and the **-EXC** and **-SEN** connections should be shorted together.



Four-Wire Analog (Load Cell) or (Junction Box) Connection



Six-Wire Analog (Load Cell) or (Junction Box) Connection

USB Port

The signal conditioner comes standard with a Type C USB port that is designed for data communication and firmware updates.

It can be connected to a PC that has a VCP (Virtual COM Port) USB driver installed. Use the Dig Comm parameter menu to configure the serial communication parameters.



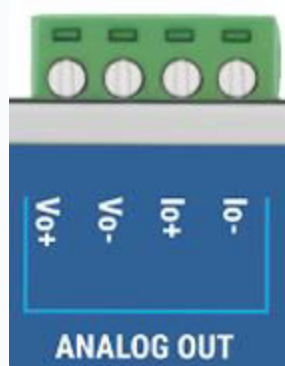
Type C USB port

Analog Output Terminal Block

Four (4) types of analog output are available:

1. Current: 4–20 mA
2. Current: -20 to +20 mA
3. Voltage: 0–10 V
4. Voltage: -10 to +10 V

Note: The current and voltage outputs cannot be used at the same time.



Analog output terminal block (Vo+, Vo-, Io+, Io-)

1) CURRENT OUTPUT

Io+ and **Io-** are the analog current output terminals.

Use the **V-mA Out\Sig Type** menu to configure the current output:

- **4-20mA** = 4–20 mA current output
- **20-20mA** = -20 to +20 mA current output; this selection is suitable for bi-directional (tension/compression) sensors.

Use the **V-mA Out\Limiter** menu to select how the current output operates with respect to the maximum capacity of the weighing system (FS). Using Sig Type = **4-20mA** as an example:

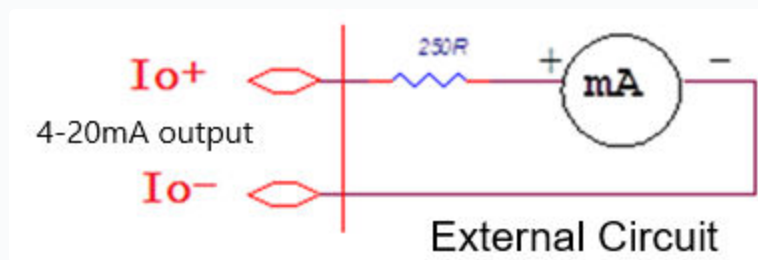
- **On** = within range. When the weight data is negative, the current output is still 4mA; when the weight data is greater than full-scale, the current output is still 20mA.
- **Off** = exceed range. When the weight data is negative, the current output can vary by 0mA at a minimum. When the weight data is greater than full-scale, the current output can reach a maximum of 23.8mA.

Use the **V-mA Out\FineTune** menu to adjust (fine-tune) the current output. Both the low end and the high end values can be adjusted. **If the analog output type is changed via **Sig Type**, you must use **FineTune** to re-adjust the analog output.**

When using the **FineTune** menu to adjust the output, we recommend that the signal conditioner be connected to an industrial receiver — such as a PLC — to monitor the adjustments.



Current output terminals (Io+, Io-)



Current Output Wiring Diagram

CAUTION

Never measure current by connecting an ammeter across the two terminals of the analog current output port. Instead measure the voltage drop across the receiver resistor.

2) VOLTAGE OUTPUT PORT

+Vo and **-Vo** are analog voltage output terminals.

Use the **V-mA Out\Sig Type** menu to configure the current output:

- **0-10V** = 0–10 V voltage output
- **-10-10V** = -10 to +10 V voltage output; this selection is suitable for bi-directional (tension/compression) sensors.

Use the **V-mA Out\FineTune** menu to select how the current output operates with respect to the maximum capacity of the weighing system (FS). Using **Sig Type** = **0-10V** as an example:

- **On** = within range. When the weight data is negative, the voltage output is still 0V; when the weight data is greater than full-scale, the voltage output is still 10V.
- **Off** = exceed range. When the weight data is negative, the voltage output is still 0V. When the weight data is greater than full-scale, the voltage output can reach a maximum of 12V.

Use the **FineTune** menu to adjust (fine-tune) the voltage output. Both the low and high values can be adjusted. If the analog output type is changed via **Sig Type**, you must use **FineTune** to re-adjust the analog output.

When using the ***FineTune*** menu to adjust the output, we recommend that the signal conditioner be connected to an industrial receiver — such as a PLC — to monitor the adjustments.



Voltage output terminals (Vo+, Vo-)

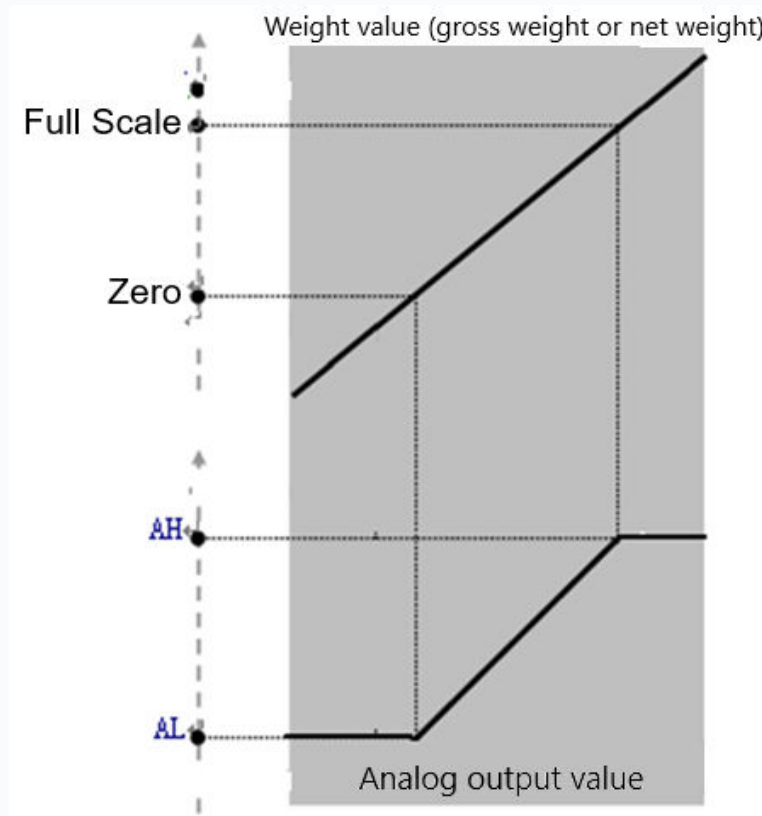
ANALOG OUTPUT PERFORMANCE INDICATORS

- The linear range of the output current is 4–20mA or -20 to +20mA; the linear range of the voltage output is **-10V to +10V or 0–10V**. The maximum load resistance is 1K ohms.
- Overall output accuracy: $\pm 0.03\%$ full scale (at 20°C).
- The analog output interface supports linear adjustment.
- Analog output relates to weight value.

Define the analog output value when AL is empty, AH is the analog output value when the scale is full, A represents the analog output, W represents the weight value, and FS represents the full scale.

Analog output and weight value relationship (take 0~24mA or 0~10V as an example):

- When $W < 0$, $A = 0\text{mA}$ or 0V .
- When $0 < W < \text{FS}$, then $A = W/\text{FS} \times (\text{AH} - \text{AL}) + \text{AL}$.
- When $W > \text{FS}$, $A = 24\text{mA}$ or 10V .

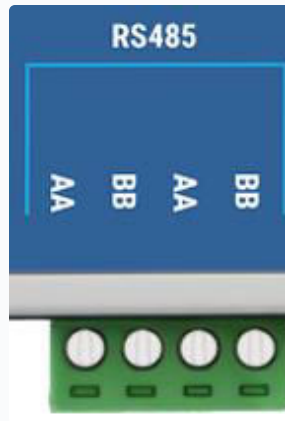


The linear relationship between analog output and weight value

RS-485 Terminal Block

The signal conditioner comes standard with a half-duplex RS-485 interface that is designed for peer-to-peer and network data communication.

To facilitate on-site network wiring, the two RS485 terminals are connected in parallel, i.e., daisy chained.

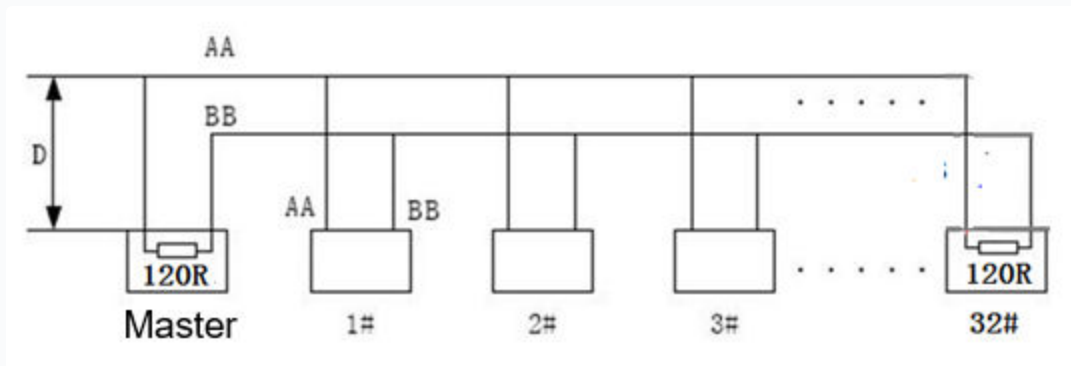


RS-485 terminal block (AA, BB, AA, BB)

RS-485 CONNECTION METHODS



Peer-to-Peer

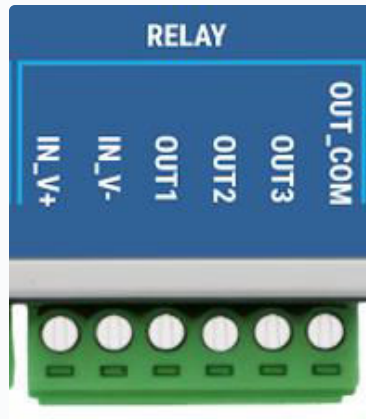


Networking

When multiple SIGNAL LINK signal conditioners are daisy chained together, a 120R terminal resistor should be connected at the two end nodes of the cable, at the nearest and farthest ends.

Use the **Dig Comm\RS485** configuration menus to set the baud rate, serial port settings and the communication protocol.

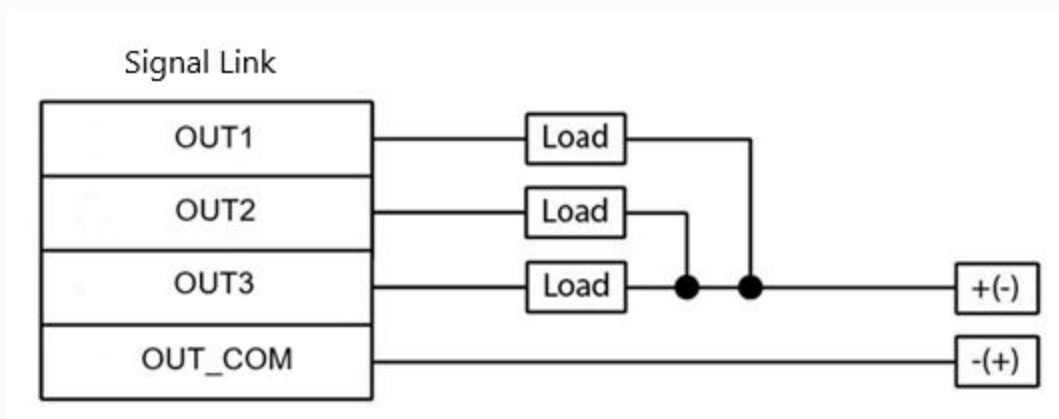
Relay Control (I/O)



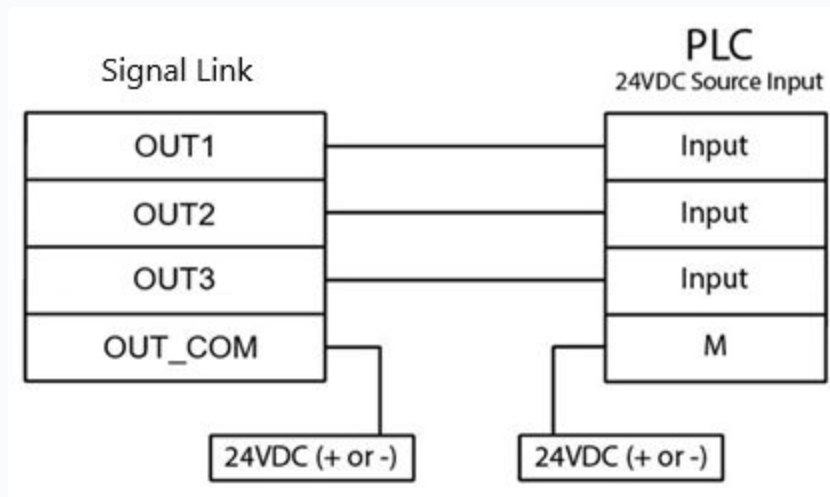
Relay control terminal block (IN_V+, IN_V-, OUT1–OUT3, OUT_COM)

OUTPUT CONNECTIONS

The **OUT1** – **OUT3** connections are normally open relay contact outputs and can be used to drive AC or DC loads. The maximum switching voltage of each relay is **250VAC / 30VDC**. The maximum switching power of each relay is **150W**. The maximum switching current of each relay is **5A**. The **OUT_COM** terminal can be connected to the positive or negative of the power supply.



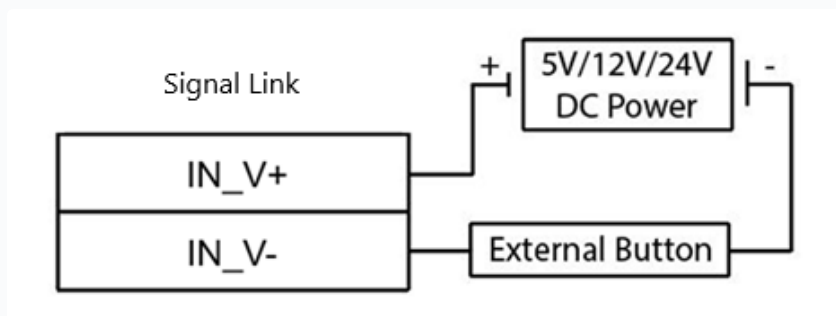
Output control interfaces and load connection diagram



Output control interfaces and PLC connection diagram

INPUT CONNECTION

The input connection is an isolated, passive input and requires an external DC power supply: drive voltage 10–30VDC, maximum current 12mA. Its primary purpose is to start the application mode. The wiring is as follows. [Man Fill]



Input connection wiring

GROUNDING TAB

The grounding tab — circled in red — is the contact point on the back of the signal conditioner to connect the device to ground via the metal DIN rail.

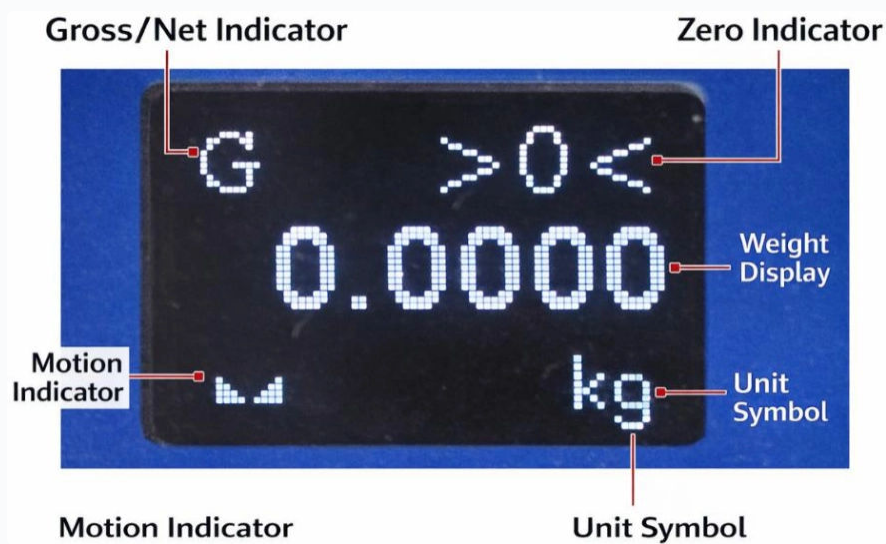


Grounding tab (circled in red)

BASIC OPERATION

The SIGNAL LINK signal conditioner starts up immediately when power is supplied. The screen displays the software version, date, `555555` ... `000000`, etc. After that, the current weight will be displayed.

This model utilizes a white dot matrix OLED (Organic Light-Emitting Diode) display. It can display up to 6 digits of weighing data. It can also display error messages.



OLED display annunciators

Symbol	Display Indication
>0<	Displays when the reading is at "Center of Zero".
N	The signal conditioner is in Net Weight mode.
G	The signal conditioner is in Gross Weight mode.
lb	The displayed weight value is in pounds (lb).
kg	The displayed weight value is in kilograms (kg).
g	The displayed weight value is in grams (g).
kN	The displayed weight value is in kilonewtons (kN).
t	The displayed weight value is in metric tons (t).
▲▲	Displays when the displayed weight value is stable.
~	Displays whenever the displayed weight value is in motion (dynamic).

STATUS LEDS

The 3 status LEDs (red, green, and orange) function when relay outputs are used.

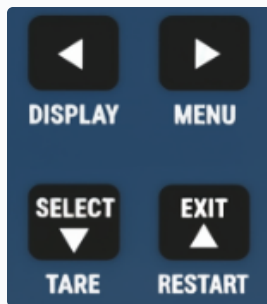
The red, green, and orange LEDs correspond to the status of Output 1, Output 2, and Output 3, respectively.



Status LEDs and front-panel QR code

KEYPAD

The keypad is composed of a total of four (4) function keys.



The four function keys

Key	Keypad Function
	Normal operating mode: Long press provides access to the various configuration menu categories. Configuration Menu: right arrow navigation.
	Normal operating mode: Long press puts the screen into sleep mode. Long press again to re-activate the screen. Configuration Menu: left arrow navigation.
	Normal operating mode: Long press establishes a system Tare and changes to Net weight mode, provided certain conditions are met. Second long press changes to Gross weight mode. Configuration Menu: down arrow navigation. Long press to Save the setting.
	Configuration Menu: up arrow navigation. Long press to Exit Configuration Menu.

CONDITIONAL KEYPAD FUNCTIONS

TARE — The displayed weight value must not be in motion or displaying an error message. In addition, the current weight must be outside the $\pm 2d$ (two scale divisions) range from zero.

ZERO (Remote command only) — The displayed weight value must not be in motion or displaying an error message. This function is only available in Gross Weight mode. Operation may be restricted by the Zero Reset Range setting (see `Measure\ZeroRang` menu parameter). Note: The “no motion” restriction can be overridden via the `Measure\ZeroStdy` parameter menu.

CONFIGURATION MENUS

The SIGNAL LINK contains six (6) menu categories to configure and calibrate the signal conditioner:

1. **Measure:** Functions affecting behavior/performance while in Run mode
2. **Cal Setup:** Calibrate the device or view the current calibration
3. **V/mA Out:** Configure analog output and calibrate downstream devices
4. **Dig Comm:** Configure USB and RS485 communication ports
5. **Relay IO:** Sets high-low input and output logic
6. **System:** System ID, system restore, mV/V calibration

Each menu category has at least three vertical levels:

1. Menu Category [Measure]
2. Parameter Level [SampRate]
3. Selection Level [10 (FIR), 20 (FIR), 50, 60, 100, 400, 1200, 2400, 4800, 7200]
or Execute Procedure

Some Parameter Levels have sub-levels. Refer to the following Menu Tree to familiarize yourself with the structure and navigation of the various menus and parameters. Use the directional keys to navigate within the Configuration Menu.

Measure	CalSetup	V/mA Out
SampRate SMA Filt StableRn ZeroTrak ZeroRang ZeroStdY AutoTare	Dec Place Count By Unit Cal Type Zero Cal Start Cal - Pos Cal - Neg Cal View Cal - ViewLive - View K-In - View mVV	Sig Type Limiter FineTune Scale A0 - Set Low - Set High Cal PLC 0% 25% 50% 75% 100%
Dig Comm	Relay IO	System
USB - baudrate - databits - protocol RS485 - baudrate - databits - protocol - Bit length ComDelay Loc Addr	AutoFill Man Fill Check Wt PassBand NONE	LCD Test Cal mV/V Reset All Read mVV

Menu Tree — configuration menu structure and parameter sub-levels.

Entering / Navigating the Configuration Menus

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Move from one menu category to the next by using the **DISPLAY ◀** or **MENU ▸** keys.
3. Once you have arrived at the menu category you wish to access, press the **SELECT ▼** key once to arrive at the parameter level.
4. Move from one parameter menu to the next by using the **DISPLAY ◀** or **MENU ▸** keys.
5. Once you have arrived at the parameter menu you wish to access, press the **SELECT ▼** key once to arrive at the selection level. The signal conditioner displays the current parameter setting.
6. If there is a selection list, scroll through the available parameter settings using the **DISPLAY ◀** or **MENU ▸** keys. Otherwise, use the arrow keys to adjust the displayed value to the new value.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▼** keys to change the flashing value.
7. Once the setting you want is displayed on the screen, long press the **SELECT ▼** key to save this value. The display will show **SET** momentarily and then revert up to the parameter level.
8. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

MEASURE MENU

Measure Menu Details

This section provides more detailed descriptions of the selections found in the Measure Menu Chart. Factory-set defaults are shown in **bold**.

Menu Item	Description	Selection Options
SampRate	List of available sampling rates on ADC. Sampling rate value expressed in Hertz (Hz).	10 HZ , 20, 50, 60, 100, 400, 1200, 2400, 4800, 7200
Avg Filt	Integer list of number of samples included in SMA; 1 = off	AUTO32 , SMA 1, SMA 2, SMA 4, SMA 8, AUTO48, AUTO64
StableRn	This sets the range within which the stability annunciator will remain lit.	Key-in 0.0 – 0.002000 mV/V 0.000200
ZeroTrak	Creates deadband around the zero point.	Key-in 0.0 – 0.002000 mV/V 0.000000
ZeroRang	Limits allowable percent of full scale that can be zeroed using remote zero command.	1.9, 2 , 20, 100
ZeroStdY	Disables or Enables stability criteria for zeroing.	Disable , Enable
AutoZero	Zeros the measured value on power up.	OFF , ON
Set0vUnd	Sets Under and Over limits	Key-in -999999 / +999999
En 0vUnd	Disables or Enables Under and Over	Disable , Enable

Setting the limits for Under and Over (SetOvUnd)

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Press the **SELECT ▾** key to enter the sub-menus. The signal conditioner displays **SamPRate**.
3. Using the **MENU ▸** key, scroll until **SetOvUnd** is displayed on the screen.
4. Push the **SELECT ▾** key once. The signal conditioner displays **Set Undr** followed by the previously saved value with one digit blinking.
5. Use the keypad to adjust the displayed under value.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the flashing value.
6. Once the under value is adjusted correctly, long press the **SELECT ▾** key to save this value. The signal conditioner displays **Set Ov** followed by the previously saved value with one digit blinking.
7. Use the keypad to adjust the displayed over value.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the flashing value.
8. Once the over value is adjusted correctly, long press the **SELECT ▾** key to save. The signal conditioner briefly displays **SET** and then reverts up to **SetOvUnd**.
9. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

CAL SETUP MENU

Cal Setup Menu Details

This section provides more detailed descriptions of the selections found in the Cal Setup Menu Chart. Factory-set defaults are shown in **bold**.

Menu Item	Description	Selection Options
Dec Place	Sets decimal place location.	0, 00, 0.0000, 0.000, 0.00, 0.0
Count By	Set minimum value of least significant digit.	1, 2, 5
Unit	Unit of measure label.	lb, kg, kN, t, g, N
Cal Type	Selects which calibration profile to use for normal operation.	Live, Key-In
Zero Cal	Starts zero calibration.	—
Start Cal	Starts live or key-in calibration routine.	—
View Cal	Shows Live Cal and mV/V definition values; Live Cal values are displayed in units of force and mV/V.	View Live, View K-In, View mVV

CALIBRATION PROCEDURES

Calibration Overview

The SIGNAL LINK can be calibrated either by using a Live calibration method or a Key-In calibration.

Live Calibration

The Live calibration method produces the best possible system accuracy. This method requires one of the following:

- A load cell (or other sensor) will be connected to the signal conditioner while a series of nominal force loads are applied to calibrate the instrument.
- A load simulator (calibrator) will be connected to the signal conditioner while a series of simulated mV/V loads are applied to calibrate the instrument.

Live calibration is accomplished by setting the Positive Span, Negative Span and Zero. You can utilize up to five (5) positive calibration points and five (5) negative calibration points. These calibration points are denoted as PP1 through PP5. The absolute value of each subsequent calibration point should be higher than the last, e.g., the PP2 value should be greater than the PP1 value, etc.

To execute a Live calibration, follow the steps below:

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **CalSetup** is displayed on the screen. Press the **SELECT ▾** key to enter the calibration sub-menus.
3. Using the **MENU ▸** key, scroll until **Start Cal** is displayed on the screen. Press the **SELECT ▾** key. The signal conditioner displays **Live Cal**.
4. Press the **SELECT ▾** key. The signal conditioner displays **Pos Cal?**

5. Long press the **SELECT ▾** key to initiate the calibration process. The term **Cal Fixt?** will show on the screen. At this point the load cell should be set into its fixture, with no calibration loads applied. If a simulator is being used for the Live calibration, connect the simulator, but set its value to 0mV/V.
6. Long press the **SELECT ▾** key to save this point. After the Fixture value has been set, the signal conditioner will prompt you to enter the data for the first calibration point (PP1). The previously saved value will be displayed with one digit blinking.
7. Use the arrow keys to adjust the displayed value to the nominal force load that is about to be applied.
 - Use the **DISPLAY ▾** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
8. Once this value has been set and the applied force load has stabilized, long press the **SELECT ▾** key to save this point. After the first calibration point (PP1) value has been set, the signal conditioner will prompt you to enter the data for the second calibration point (PP2). The previously saved value will be displayed with one digit blinking.
9. To add another calibration point (up to five are possible) repeat the actions in Steps 7–8. To end the calibration, leave the numerical field as 0 and long press the **SELECT ▾** key.

IF CALIBRATION WAS NOT SUCCESSFUL

One of the following error messages will appear. Take the indicated action to correct the problem and then perform a new calibration.

- **ERR0** — The calibration weight or the keyed-in weight is larger than the maximum capacity of the weighing system. Change the calibration weight or check the entered data.
- **ERR1** — The calibration weight or the keyed-in weight is smaller than 1% of the maximum capacity of the weighing system. Change the calibration weight or check the entered data.
- **ERR2** — The load cell input signal is too small to allow for proper calibration. Most common causes include incorrect load cell wiring, mechanical obstruction or a faulty (damaged) load cell.

10. If needed, repeat this process in the opposite direction (**Neg Cal?**). Otherwise, press and hold the **EXIT ▲** key. The term **Save Cal?** will show on the screen.

11. Either long press the **SELECT ▾** key to save the calibration or long press the **EXIT ▲** key to exit without saving.
12. Proceed to Zero calibration.

Zero Calibration

If the unit is already in the **CalSetup** menu category, skip to #3.

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **CalSetup** is displayed on the screen. Press the **SELECT ▾** key to enter the calibration sub-menus.
3. Using the **MENU ▸** key, scroll until **Zero Cal** is displayed on the screen. Press the **SELECT ▾** key. The screen will momentarily show **C 0** followed by a value.
4. At this point, the Zero Calibration is ready to begin. Be sure the load cell is connected and in an unloaded state. If using a simulator, be sure that the simulator is set to 0 mV/V.
5. Long press the **SELECT ▾** key to initiate the Zero Calibration. The screen will momentarily show **SET** followed by **END C0** before reverting up to the **Zero Cal** level.
6. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

Key-in Calibration

The Key-In calibration method is typically only used in emergency cases when the signal conditioner cannot receive a Live calibration. The Key-In method uses multiple points to establish the span of the load cell. It ignores load cell nonlinearity and any asymmetry between the opposing loading modes.

To execute a Key-In calibration, follow the steps below:

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **CalSetup** is displayed on the screen. Press the **SELECT ▾** key to enter the calibration sub-menus.

3. Using the **MENU ▸** key, scroll until **Start Cal** is displayed on the screen. Press the **SELECT ▾** key. The signal conditioner displays **Live Cal**.
4. Press the **MENU ▸** key. The signal conditioner displays **Key Cal**.
5. Press the **SELECT ▾** key. The signal conditioner displays **Pos Cal?** indicating loading in a positive direction.
6. Long press the **SELECT ▾** key to initiate the calibration process. The signal conditioner will prompt you to enter the data for the first calibration point (PP1 Val). The previously saved value will be displayed with one digit blinking.
7. Use the arrow keys to adjust the displayed value to the nominal force load that is about to be applied.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
8. Once this value has been set, long press the **SELECT ▾** key to save this point. The signal conditioner will then prompt you to enter the sensitivity (mV/V) data corresponding to the first calibration point (PP1 MMV). The previously saved value will be displayed with one digit blinking.
9. Use the arrow keys to adjust the displayed value to the corresponding mV/V data.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
10. Once this value has been set, long press the **SELECT ▾** key to save this point. The signal conditioner will prompt you to enter the data for the second calibration point (PP2 Val). The previously saved value will be displayed with one digit blinking.
11. To add another calibration point (up to five are possible) repeat the actions in Steps 7–8. To end the calibration, leave the numerical field as 0 and long press the **SELECT ▾** key.
12. If needed, repeat this process in the opposite direction (**Neg Cal?**). Otherwise, press and hold the **EXIT ▲** key. The term **Save Cal?** will show on the screen.
13. Either long press the **SELECT ▾** key to save the calibration or long press the **EXIT ▲** key to exit without saving.
14. Proceed to Zero calibration.

View Calibration Data

This function allows viewing of stored calibration values and is used primarily for debugging purposes.

There are three (3) sub-menus:

- **View Live:**

Live Cal Positive Span, PP1 to PP5 (mV/V value & Loading value)

Live Cal Negative Span, NP1 to NP5 (mV/V value & Loading value)

- **View K-In:**

Live Cal Positive Span, PP1 to PP5 (mV/V value & Loading value)

Live Cal Negative Span, NP1 to NP5 (mV/V value & Loading value)

- **View mVV:**

Low AD, Low mVV, High AD, High mVV

To view calibration data, follow the steps below:

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **CalSetup** is displayed on the screen. Press the **SELECT ▾** key to enter the calibration sub-menus.
3. Using the **MENU ▸** key, scroll until **View Cal** is displayed on the screen. Press the **SELECT ▾** key. The signal conditioner displays **View Live**.
4. Use the **MENU ▸** key to select the required sub-menu.
5. Press the **SELECT ▾** key. For **View Live** and **View K-In**, the signal conditioner displays the mV/V value for PP1 (**PP1 mVV**).
For **View mVV**, the signal conditioner displays the low AD value (**Low AD**).
6. Press the **SELECT ▾** key. For **View Live** and **View K-In**, the signal conditioner displays the loading value for PP1 (**PP1 Val**).
For **View mVV**, the signal conditioner displays the low mV/V value (**Low mVV**).
7. To continue displaying the rest of the calibration data, keep pressing the **SELECT ▾** key until you reach the end of the list at which point the signal conditioner reverts up to the sub-menu level.
8. To exit the Configuration Menu, simply press and hold the **EXIT ◀** key for a few seconds.

V/MA OUT SETUP MENU

V/mA Out Menu Details

This section provides more detailed descriptions of the selections found in the V/mA Out Menu Chart. Factory-set defaults are shown in **bold**.

Menu Item	Description	Selection Options
Sig Type	Sets analog output signal type and range.	OFF , 4-20mA, 20-20mA, 0-10v, -10-10v
Limiter	Prevents analog signal from exceeding full scale (10V or 20mA)	On , Off
FineTune	Adjusts the analog output at minimum, mid-point, and maximum.	—
Scale AO	Scales the analog output between a low and a high force point.	—
Cal PLC	Sequences analog output signal through 0%, 25%, 50%, 75% and 100%.	—

Adjust the analog output (FineTune)

The analog output was adjusted before the signal conditioner left our factory. However, if a difference is found in the measured output at the industrial receiver (e.g., PLC), it can be re-adjusted (“fine-tuned”) using this procedure. The usable range of the output adjustment is (0–65535).

The **DA LO** adjustment is for the low output, the **DA MID** adjustment is for the mid-point output and the **DA HI** adjustment is for the high output. The low and high outputs depend on the configuration setting and are defined in the following table:

Sig Type Setting	Low output (DA LO)	Mid-point output (DA MID)	High output (DA HI)
4-20mA	4.000 mA	4.000 mA	20.000 mA
20-20mA	-20.000 mA	-20.000 mA	20.000 mA
0-10V	0.000 V	0.000 V	10.000 V
-10-10V	-10.000 V	-10.000 V	10.000 V

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **V/mA Out** is displayed on the screen. Press the **SELECT ▾** key to enter the sub-menus.
3. Using the **MENU ▸** key, scroll until **FineTune** is displayed on the screen.
4. Press the **SELECT ▾** key. The signal conditioner displays **DA LO** briefly and then displays a number with a flashing digit. **The unit outputs the low output value from the above table.**
5. Use the keypad to adjust this value which in turn adjusts the analog output.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
6. Once the measured output is adjusted correctly, long press the **SELECT ▾** key to save this value. The signal conditioner displays **SET** and **DA MID** briefly and then displays a number with a flashing digit. **The unit outputs the mid-point output value from the above table.**
7. Use the keypad to adjust this value which in turn adjusts the analog output.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
8. Once the measured output is adjusted correctly, long press the **SELECT ▾** key to save this value. The signal conditioner displays **SET** and **DA HI** briefly and then displays a number with a flashing digit. **The unit outputs the high output value from the above table.**
9. Use the keypad to adjust this value which in turn adjusts the analog output.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.

10. Once the measured output is adjusted correctly, long press the **SELECT ▾** key to save this value.
11. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

Scale the analog output (Scale AO)

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **V/mA Out** is displayed on the screen. Press the **SELECT ▾** key to enter the sub-menus.
3. Using the **MENU ▸** key, scroll until **Scale AO** is displayed on the screen.
4. Push the **SELECT ▾** key once. The signal conditioner displays **Set Low?** indicating a low force point.
5. Long press the **SELECT ▾** key to initiate the scaling process. The previously saved value will be displayed with one digit blinking.
6. To skip this point, long press the **EXIT ▲** key. Otherwise, use the keypad to adjust the displayed low force value.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
7. Once the force value is adjusted correctly, long press the **SELECT ▾** key to save. The signal conditioner displays **Set High?** indicating a high force point.
8. Long press the **SELECT ▾** key to initiate the scaling process. The previously saved value will be displayed with one digit blinking.
9. To skip this point, long press the **EXIT ▲** key. Otherwise, use the keypad to adjust the displayed high force value.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
10. Once the force value is adjusted correctly, long press the **SELECT ▾** key to save. The signal conditioner displays **Save?**

11. Either long press the **SELECT ▾** key to save the calibration or long press the **EXIT ▲** key to exit without saving.
12. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

Calibrate PLC (Cal PLC)

The range of analog output values depends on the configuration setting and is defined in the following table:

Sig Type Setting	1st value	2nd value	3rd value	4th value	5th value
4-20mA	4.000 mA	8.000 mA	12.000 mA	16.000 mA	20.000 mA
20-20mA	-20.000 mA	-10.000 mA	0.000 mA	10.000 mA	20.000 mA
0-10V	0.000 V	2.500 V	5.000 V	7.500 V	10.000 V
-10-10V	-10.000 V	-5.000 V	0.000 V	5.000 V	10.000 V

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **V/mA Out** is displayed on the screen. Press the **SELECT ▾** key to enter the sub-menus.
3. Using the **MENU ▸** key, scroll until **Cal PLC** is displayed on the screen.
4. Push the **SELECT ▾** key once. The signal conditioner displays the value of the analog output, e.g., **-20mA**.
5. To continue displaying the rest of the calibration data, keep pressing the **SELECT ▾** key until you reach the end of the list at which point the signal conditioner reverts up to the sub-menu level.
6. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

DIG COMM MENU

Dig Comm Menu Details

This section provides more detailed descriptions of the selections found in the Dig Comm Menu Chart. Factory-set defaults are shown in **bold**.

Menu Item	Sub-Menu	Description	Selection Options
USB	BaudRate	Configures the USB port baud rate.	2400, 4800, 9600, 19200 , 38400, 57600
USB	DataBits	Configures the USB port data bits.	8-N-1 , 7-O-1, 7-E-1, 8-E-1
USB	Protocol	Configures the USB port protocol.	PT5DEM , PT5CON, PT 0, PT1, PT2DEM, PT2CON
RS485	BaudRate	Configures the RS-485 port baud rate.	2400 , 4800, 9600, 19200, 38400, 57600
RS485	DataBits	Configures the RS-485 port data bits.	8-N-1 , 8-E-1
RS485	Protocol	Configures the RS-485 port protocol.	PRT 0, PRT 1, PT2CON, PT2DEM, PT5CON, PT5DEM, MB_RTU
RS485	Bit Leng	Configures the weight data field length for Modbus RTU protocol.	16BITS, 32BITS
RS485	Loc Addr	Sets the local address for the RS-485 interface.	ADR-01 – ADR-32 ADR-01
ComDelay	—	Configures the communication response delay in milliseconds.	0 – 10 2

Entering the Dig Comm Menu

1. Press and hold the **MENU ▶** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.

2. Using the **MENU ▸** key, scroll until **Dig Comm** is displayed on the screen. Press the **SELECT ▾** key to enter the parameter level.
3. Move from one parameter menu to the next by using the **DISPLAY ◀** or **MENU ▸** keys.
4. Once you have arrived at the parameter menu you wish to access, press the **SELECT ▾** key once to arrive at the selection level. The signal conditioner displays the current parameter setting. Note that some parameter menus contain a sub-menu level.
5. If there is a selection list, scroll through the available parameter settings using the **DISPLAY ◀** or **MENU ▸** keys. Otherwise, use the arrow keys to adjust the displayed value to the new value.
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the flashing value.
6. Once the setting you want is displayed on the screen, long press the **SELECT ▾** key to save this value. The display will show **SET** momentarily and then revert up to the parameter level.
7. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

Continuous output format 1 (PRT 0)

In this communication format, the SIGNAL LINK continuously transmits data frames; the weight value within each frame is represented in ASCII code, as shown below.

Byte	Bit	Description
Byte 0	—	Frame starter (always 02 in hexadecimal)
Byte 1 Status word A	Bit 0	0 = Normal weighing status / 1 = Setting or overloaded weight
	Bit 1	Preset point 0 state
	Bit 2	Preset point 1 state
	Bit 3	Preset point 2 state
	Bit 4	Constant is 0
	Bit 5	Always is 1
	Bit 6	Constant is 0
	Bit 7	Constant is 0
Byte 2 Status word B	Bit 0	0 = no tare / 1 = with tare weight
	Bit 1	0 = Stable display weight / 1 = Display weight is dynamic
	Bit 2–4	When the weight is displayed steadily, the three-digit combination indicates the decimal position of the weight data: 100 = XXXXXX. 101 = XXX.XXX 110 = XXXX.XX 111 = XXXXX.X 001 = XX.XXXX 000 = XXXXX0
	Bit 5	Always is 1
	Bit 6	Constant is 0
	Bit 7	Constant is 0
Byte 3	—	Weight value symbol bit: “+” / “-”

Byte	Bit	Description
Bytes 4~8	—	When the tare weight is zero, the gross weight value is output; when the tare weight is not zero, the net weight value is output
Byte 9	—	Frame end (always 03 in hexadecimal)

The SIGNAL LINK accepts single-byte commands in ASCII character format from external sources; the commands it can process are listed below. The conditions under which the SIGNAL LINK executes these commands are identical to those for keyboard operations.

Byte command	Description
'T'	Tare request
'C'	Clear Tare request
'Z'	Weight Zero request
'R'	Weighing signal conditioner reset

Since the RS485 communication interface operates in half-duplex mode, the host computer must immediately transmit a command upon receiving a data frame to prevent bidirectional data conflicts.

Continuous output format 2 (PRT 1)

In this communication format, the SIGNAL LINK continuously transmits data frames; the weight value within each frame is represented in ASCII code, as shown below.

Byte order	Bit	Description
Byte 0	—	Starting Symbol (Always 02 in hexadecimal)
Byte 1 Status word A	Bit 0–2	The combination of three bits represents the decimal point position of the weight data: 010 = XXXXXX. 011 = XXXXX.X 100 = XXXX.XX 101 = XXX.XXX 110 = XX.XXXX 111 = XXXXX0
	Bit 3–4	01 = Index value rounded to 2 10 = index value rounded to 1 11 = index value rounded to 5
	Bit 5	Constant is 1
	Bit 6	Constant is 1
	Bit 7	0
Byte 2 Status word B	Bit 0	0 = no tare / 1 = with tare weight
	Bit 1	0 = Positive Weight Displayed / 1 = Negative Weight Displayed
	Bit 2	0 = Shows the weight in the range / 1 = Indicates that the weight is out of range
	Bit 3	0 = Stable display weight / 1 = Display weight is dynamic
	Bit 4	Constant is 1
	Bit 5	Constant is 1
	Bit 6	IO menu is SetTa mode: 0 = fixed value feeding is not running or feeding is over; 1 = Constant feed is running (triggering IN port)
	Bit 7	0
Byte 3	—	The status word C is always 70H

Byte order	Bit	Description
Bytes 4~9	—	When the tare weight is zero, the gross weight value is output; when the tare weight is not zero, the net weight value is output
Bytes 10~15	—	Tare weight value
Byte 16	—	Car Return (=0DH)

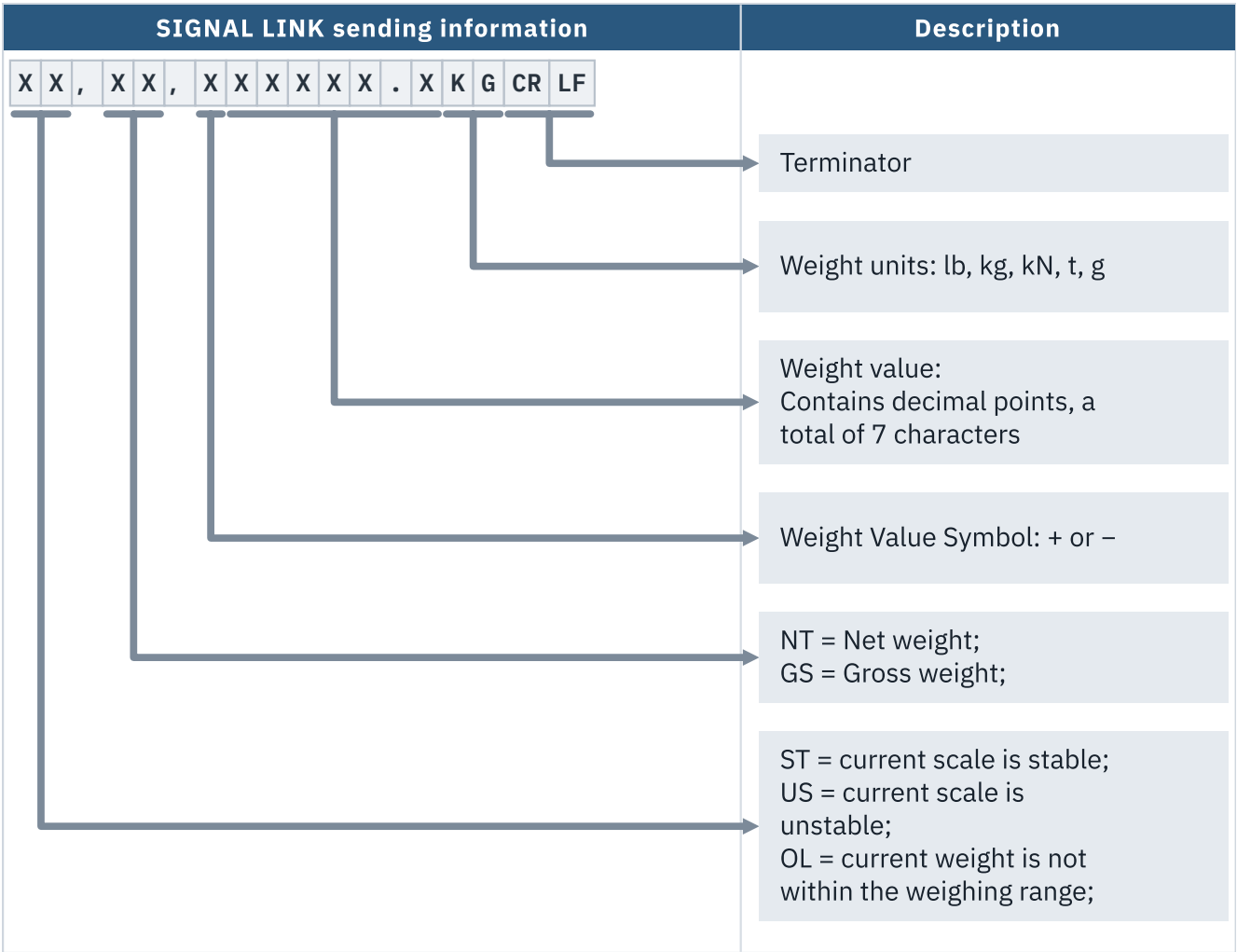
The SIGNAL LINK accepts single-byte commands in ASCII character format from external sources; the commands it can process are listed in the table below. The conditions under which the SIGNAL LINK executes these commands are identical to those for keyboard operations.

Byte command	Description
'T'	Tare request
'C'	Clear Tare request
'Z'	Weight Zero request

Since the RS485 communication interface operates in half-duplex mode, the host computer must immediately transmit a command upon receiving a data frame to prevent bidirectional data conflicts.

Continuous output format 3 (PT2CON)

In this communication format, the SIGNAL LINK continuously transmits data frames; the weight value within each frame is represented in ASCII code, as shown below.



Force Transmission Command Output Format 1 (PT2DEM)

When the SIGNAL LINK is in normal weighing mode, the corresponding serial port operates in a command-response format; data is output only when a specific command is entered (each command input triggers the output of a single data frame).

The input command format is as follows:

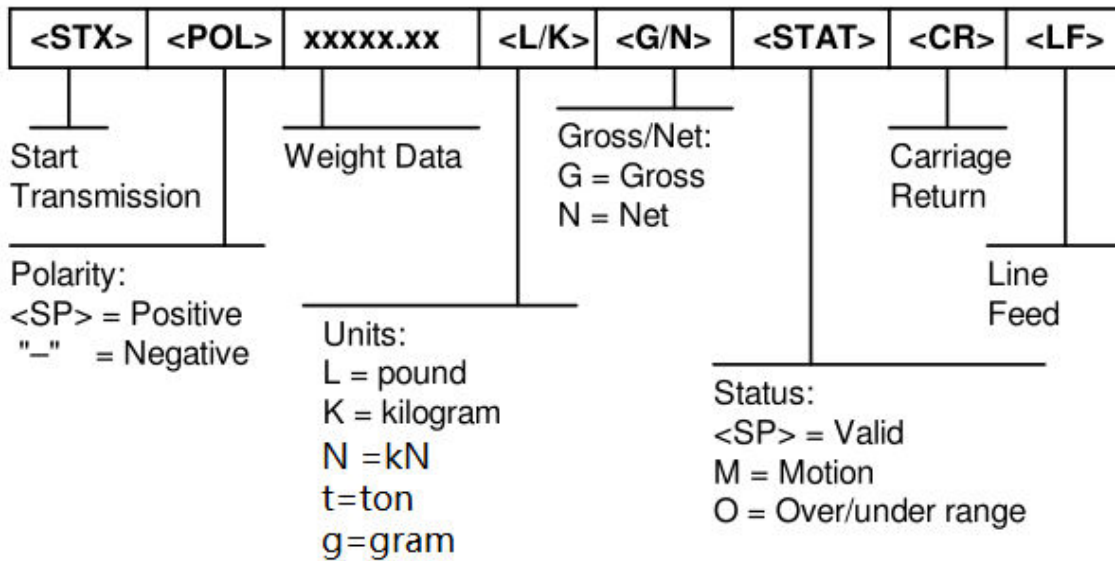
R	E	A	D	CR	LF
(0x52)	(0x45)	(0x41)	(0x44)	(0x0D)	(0x0A)

The serial port output data format is as follows:

SIGNAL LINK sending information	Description
X X , X X , X X X X X . X K G CR LF	
	Terminator
	Weight units: kg, lb, kN, t, g
	Weight value: Contains decimal points, a total of 7 characters
	Weight Value Symbol: + or –
	NT = Net weight; GS = Gross weight;
	ST = current scale is stable; US = current scale is unstable; OL = current weight is not within the weighing range;

Continuous Output Format 4 (PT5CON)

In the Condec Continuous String format, the SIGNAL LINK continuously outputs data; the protocol format for each frame is as follows:



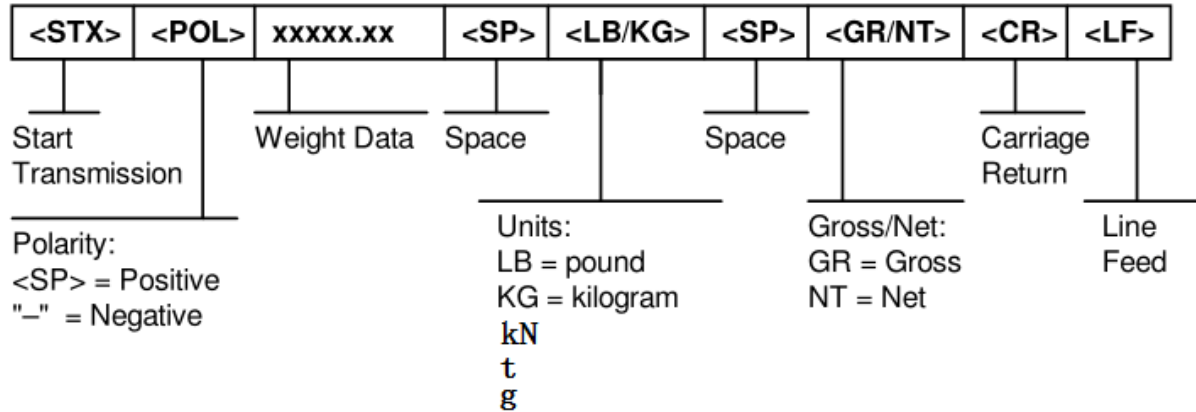
The SIGNAL LINK accepts single-byte commands in ASCII character format from external sources; the commands it can process are listed in the table below. The conditions under which the SIGNAL LINK executes these commands are identical to those for keyboard operations.

Byte command	Description
'C'	Toggle weight unit request.
'Z'	Weight Zero request.
'G'	If it is currently in the "N" state, switch to the "Gross" state, otherwise the command is not valid.
'N'	If it is currently in the 'G' state, switch to the 'Net' state, otherwise the command is not valid.
'T'	If there is currently "Tare", clear "Tare" and the signal conditioner screen displays the gross weight value; if there is no Tare, set Tare and the net weight value is displayed on the signal conditioner screen.

Since the RS485 communication interface operates in half-duplex mode, the host computer must immediately transmit a command upon receiving a data frame to prevent bidirectional data conflicts.

Force Transmission Command Output Format 2 (PT5DEM)

In the Condec Demand String format, the SIGNAL LINK transmits a data frame only when the host device or PC sends a 'P' command. The frame protocol format is as follows:



In this communication mode, the SIGNAL LINK can accept single-byte commands in ASCII character format from an external source. The commands that can be processed are listed in the table below. The conditions under which the SIGNAL LINK executes these commands are identical to those for keyboard operations.

Byte command	Description
'P'	Request the signal conditioner to send display weight data.
'C'	Toggle weight unit request.
'Z'	Weight Zero request.
'G'	If it is currently in the "N" state, switch to the "Gross" state, otherwise the command is not valid.
'N'	If it is currently in the 'G' state, switch to the 'Net' state, otherwise the command is not valid.
'T'	If there is currently "Tare", clear "Tare" and the signal conditioner screen displays the gross weight value; if there is no Tare, set Tare and the net weight value is displayed on the signal conditioner screen.

MODBUS-RTU Output Format (MB_RTU)

Modbus is a master-slave network communication protocol; within a Modbus network, the SIGNAL LINK functions as a slave device, responding to commands issued by a host system. This DIN-rail signal conditioner utilizes a half-duplex RS485 bus and supports read and write operations via the Modbus-RTU protocol. The function code for reading data from the signal conditioner is “03,” while the function code for performing write operations is “06.”

The A22 menu offers 16-bit and 32-bit options for weight data selection.

Mapping of Signal Link content in MODBUS:

“03” function code (read-only)		
Address	Bit	Description
40001	—	DataBits=16Bits: Read the displayed value (gross or net weight); DataBits=32Bits: Read the upper 16 bits of the net weight value
40002	—	DataBits=16Bits: Read the tare weight value; DataBits=32Bits: Read the lower 16 bits of the net weight value
40004 Status word	BIT 0	0: Positive ; 1: Negative sign
	BIT 1	0: Unstable ; 1: Stable
	BIT 2	0: Normal ; 1: Overflow
	BIT 3–5	Decimal point: 010=0; 011=0.0; 100=0.00; 101=0.000; 110=0.0000; 111=0
	BIT 6–7	Status: 0b00 = menu mode, 0b01 = normal weighing mode.
	BIT 8–10	Unit: 001 kg ; 010: lb; 011 g; 100 t; 101 kN
	BIT 11–13	Error: 0b001 = AD count is out of range; 0b010 = No AD data reading for more than 3 seconds; 0b000 = Normal status.
40005	—	Read the upper 16 bits of the tare value.
40006	—	Read the lower 16 bits of the tare value.

“06” function code (writable)		
Address	Bit	Description
40003	BIT 0	Write 1 = Tare the signal conditioner;
	BIT 1	Write 1 = clear the Tare;
	BIT 2	Write 1 = zero the signal conditioner;
	BIT 3-7	Not defined

Note: The starting address of MODBUS 40001 is not suitable for Siemens software S4 version or lower.

RELAY IO MENU

The Relay IO Menu sets all parameters related to relay control (I/O).

The functions in this Menu compare the gross or net weight on the load receiving device against a preset target value to enable functions such as check-weighing, sorting, alarm functions, etc.

This function is commonly used in automated control. For example, in an automated filling system, once the signal conditioner receives a start signal, it controls a feeding system to fill a container to the target value before shutting off the feeding valve.

The I/O ports provide real-time weight-related signals to a host system, or to multiple controllers simultaneously. The host system uses these signals from the signal conditioner to execute operational programs. This can be applied to different materials or to different weight setpoints for the same material.

Relay IO Menu Descriptions

This section provides more detailed descriptions of the selections found in the Relay IO Menu Chart. Factory-set defaults are shown in **bold**.

Menu Item	Description	Selection Options
Relay IO	Configures the function of the Relay Control I/O.	NONE , AutoFill, Man Fill, Check Wt, PassBand

Entering the IO Menu

Realize that selecting a function in this menu will prompt you to enter 2–3 target weights, also known as Set Points. For **AutoFill** and **Man Fill** these are Point 1, Point 2, and Point 3. For **Check Wt** these are Low, High, and Ex High. For **PassBand** these are Low and High.

Note: For **AutoFill** and **Man Fill**, Point 2 must be greater than or equal to Point 1, and Point 3 must be greater than or equal to Point 2. For **Check Wt**, Ex High must be greater than or equal to High and High must be greater than or equal to Low.

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **Relay IO** is displayed on the screen. Press the **SELECT ▾** key to enter the selection list level.
3. Scroll through the available parameter settings using the **DISPLAY ◀** or **MENU ▸** keys.
4. Once the setting you want is displayed on the screen, long press the **SELECT ▾** key to save this value and begin entering the three target weights:
 - Use the **DISPLAY ◀** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the **flashing** value.
5. Once the value you want is displayed on the screen, long press the **SELECT ▾** key.
6. Repeat this process until all three target weights have been entered.
7. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

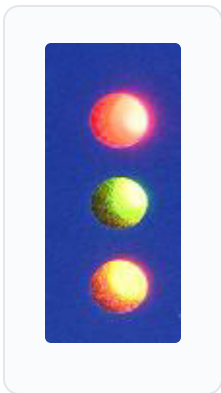
Auto Fill Mode [AutoFill]

Below is a summary table of the relay output states for **Auto Fill Mode**:

Displayed weight value (wt)	OUT1	OUT2	OUT3
$wt \leq \text{Point 1}$	ON	ON	ON
$\text{Point 1} < wt \leq \text{Point 2}$	OFF	ON	ON
$\text{Point 2} < wt \leq \text{Point 3}$	OFF	OFF	ON
$\text{Point 3} < wt$	OFF	OFF	OFF

Note: ON means “Relay contacts are closed” (conducting) and OFF means “Relay contacts are open” (not conducting).

Status LEDs on the front panel indicate when a relay output is closed by lighting up:



- The red LED corresponds to the status of OUT1
- The green LED corresponds to the status of OUT2
- The orange LED corresponds to the status of OUT3

The relay outputs are **unlatched**, meaning that if the displayed weight value somehow drops below a certain target weight, the relay outputs re-activate.

Manual Fill Mode [Man Fill]

Manual Fill Mode is identical to Auto Fill Mode except for three things:

1. The process must be triggered manually via the input connection (IN_V+ / IN_V-).
2. The *change* in weight is relative to the moment a start signal is received—regardless of the initial weight at that moment.
3. The relay outputs are **latched**, meaning that if the displayed weight value somehow drops below a certain target weight, the relay outputs do not re-activate.

Check Weight Mode [Check Wt]

Below is a summary table of the relay output states for this mode:

Displayed weight value (wt)	OUT1	OUT2	OUT3
$wt \leq \text{LOW}$	OFF	OFF	ON
$\text{LOW} < wt \leq \text{High}$	OFF	OFF	OFF
$\text{High} < wt \leq \text{ExHigh}$	OFF	ON	OFF
$\text{ExHigh} < wt$	ON	OFF	OFF

Note: ON means “Relay contacts are closed” (conducting) and OFF means “Relay contacts are open” (not conducting).

Status LEDs on the front panel indicate when a relay output is closed by lighting up:



- The red LED corresponds to the status of OUT1 (“Low”)
- The green LED corresponds to the status of OUT2 (“High”)
- The orange LED corresponds to the status of OUT3 (“ExHigh”)

The relay outputs are **unlatched**, meaning that if the displayed weight value somehow drops below a certain target weight, the relay outputs re-activate.

Pass Band Mode [PassBand]

Below is a summary table of the relay output states for this mode:

Displayed weight value (wt)	OUT1	OUT2	OUT3
$wt \leq \text{LOW}$	OFF	OFF	ON
$\text{LOW} < wt \leq \text{High}$	OFF	ON	OFF
$\text{High} < wt$	ON	OFF	OFF

Note: ON means “Relay contacts are closed” (conducting) and OFF means “Relay contacts are open” (not conducting).

Status LEDs on the front panel indicate when a relay output is closed by lighting up:



- The red LED corresponds to the status of OUT1 (“High”)
- The green LED corresponds to the status of OUT2 (“Pass”)
- The orange LED corresponds to the status of OUT3 (“Low”)

The relay outputs are **unlatched**, meaning that if the displayed weight value somehow drops below a certain target weight, the relay outputs re-activate.

SYSTEM MENU

System Menu Details

This section provides more detailed descriptions of the selections found in the System Menu Chart. Factory-set defaults are shown in **bold**.

Menu Item	Description
LCD Test	Activates the OLED display segment test. Press any key to exit.
Cal mV/V	Starts reference calibration.
Reset All	This will reset all parameters in the configuration menus to the default settings. USE WITH CAUTION!
Read mV/V	Immediately displays mV/V readout.
PassEn	Disables or Enables password protection; Default setting is Disable.
PassSet	Sets a new password.

Testing the OLED [LCD Test]

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **System** is displayed on the screen. Press the **SELECT ▾** key to enter the parameter level.
3. Using the **MENU ▸** key, scroll until **LCD Test** is displayed on the screen.
4. Press the **SELECT ▾** key to initiate the test. The screen alternates from empty screen to full screen.
5. Exit the test by pressing any key.
6. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

Reference Calibration [Cal mV/V]

Reference calibration must be completed prior to using Key-in calibration mode. This method requires a connected load simulator (calibrator).

Simulated mV/V loads are applied to calibrate the signal conditioner. Two (2) calibration points are available, designated as “Low” and “High”. Both points can be any mV/V value of your choice. The maximum value is 4.5000 mV/V.

To skip either calibration point, simply long press the **EXIT ▴** key.

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **System** is displayed on the screen. Press the **SELECT ▾** key to enter the parameter level.
3. Using the **MENU ▸** key, scroll until **Cal mV/V** is displayed on the screen.
4. Push the **SELECT ▾** key once. The signal conditioner displays **Enter PW** followed by **000000** with one digit blinking.
5. Use the keypad to adjust the displayed value to the previous password. If the previous password is unknown enter 336699.
 - Use the **DISPLAY ▹** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▴** or **SELECT ▾** keys to change the flashing value.
6. Long press the **SELECT ▾** key to enter this value. The signal conditioner displays **OK** briefly followed by **Cal Low?**
7. Long press the **SELECT ▾** key to initiate the calibration process. The signal conditioner will prompt you to enter the sensitivity (mV/V) data corresponding to the first calibration point (Low). The previously saved value will be displayed with one digit blinking.
8. Use the arrow keys to adjust the displayed value to the nominal force load that is about to be applied.
 - Use the **DISPLAY ▹** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▴** or **SELECT ▾** keys to change the flashing value.
9. Once this value has been set, long press the **SELECT ▾** key to save this point. The signal conditioner displays **Cal High?**

10. Long press the **SELECT ▾** key to initiate the calibration process. The signal conditioner will prompt you to enter the sensitivity (mV/V) data corresponding to the second calibration point (High). The previously saved value will be displayed with one digit blinking.
11. Use the arrow keys to adjust the displayed value to the corresponding mV/V data.
 - Use the **DISPLAY ▾** or **MENU ▸** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the flashing value.
12. Once this value has been set, long press the **SELECT ▾** key to save this point. The term **Save Cal?** will show on the screen.
13. Either long press the **SELECT ▾** key to save the calibration or long press the **EXIT ▲** key to exit without saving.

Resetting all parameters [Reset All]

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **System** is displayed on the screen. Press the **SELECT ▾** key to enter the parameter level.
3. Using the **MENU ▸** key, scroll until **Reset All** is displayed on the screen.
4. Press the **SELECT ▾** key to initiate the process. The term **Reset?** will show on the screen.
5. Long press the **SELECT ▾** key to initiate the process or long press the **EXIT ▲** key to exit without resetting anything.
6. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

Reading the input signal [Read mVV]

1. Press and hold the **MENU ▸** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ▸** key, scroll until **System** is displayed on the screen. Press the **SELECT ▾** key to enter the parameter level.
3. Using the **MENU ▸** key, scroll until **Read mVV** is displayed on the screen.

4. Press the **SELECT ▾** key to initiate the reading. The screen displays the current input signal in mV/V.
5. Exit this mode by pressing and holding the **EXIT ▲** key for a few seconds.
6. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

Setting the password (PassSet)

Before setting the new password, the previous password must be entered first.

1. Press and hold the **MENU ►** key for about two (2) seconds until **MENU** is briefly displayed. The signal conditioner displays **Measure**.
2. Using the **MENU ►** key, scroll until **System** is displayed on the screen. Press the **SELECT ▾** key to enter the parameter level.
3. Using the **MENU ►** key, scroll until **PassSet** is displayed on the screen.
4. Push the **SELECT ▾** key once. The signal conditioner displays **Enter PW** followed by **000000** with one digit blinking.
5. Use the keypad to adjust the displayed value to the previous password. If the previous password is unknown enter 336699.
 - Use the **DISPLAY ◀** or **MENU ►** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the flashing value.
6. Once the previous password has been set correctly, long press the **SELECT ▾** key to enter this value. The signal conditioner displays **New PW** followed by **000000** with one digit blinking.
7. Use the keypad to adjust the displayed to the new password.
 - Use the **DISPLAY ◀** or **MENU ►** keys to change the position of the flashing digit.
 - Use the **EXIT ▲** or **SELECT ▾** keys to change the flashing value.
8. Once the new password has been set correctly, long press the **SELECT ▾** key to save. The signal conditioner briefly displays **SET** and then reverts up to **PassSet**.
9. To exit the Configuration Menu, simply press and hold the **EXIT ▲** key for a few seconds.

ADVANCED OPERATION

Net Weight

Gross weight refers to the total weight of a product and its packaging. Conversely, **net weight** refers to the weight of the product alone, discounting the weight of its container or packaging; and **tare weight** is the weight of the packaging alone.

1. When weighing an item in a container, place the empty container onto the scale system's platform / load receiving device.
2. After allowing the displayed weight value to stabilize, long press the **SELECT ▾** key. The display shows zero weight, and the **N** symbol is activated indicating Net weight.
3. Add the material / load to the scale and allow the weight indication to stabilize. The displayed weight value is the Net value of the applied load.
4. Press the **SELECT ▾** key again to clear the tare value and return to gross weighing mode.

ERROR MESSAGES

Message	Meaning
OVER	The weighing capacity of the weighing system has been exceeded.
UNDER	The weight on the load receiver is below Gross zero.
Err	You have attempted to enter a value that is out of range.

SPECIFICATIONS

SENSOR INPUT

Input Signal Range	± 4.5 mV/V
Sensor Capacity	Up to $8 \times 350 \Omega$ load cells
Sense Wiring	4-wire or 6-wire sense
Excitation	5 V AC excitation

MEASUREMENT PROCESSING

Sampling Rate	10 – 7200 Hz, selectable
Internal Resolution	1,000,000 counts per mV/V
SMA Filter	1, 2, 4, 8 samples
Dynamic Filter	32 / 48 / 64 samples
FIR Filter	Auto-on @ 10 & 20 Hz
Zeroing	Auto-zero · Tare · Track
Zero Tracking	0 – 0.002 mV/V

DIGITAL COMMUNICATION

Connection Types	RS-485 · USB-C
RS-485 Protocol	Modbus-RTU, half-duplex
Network Nodes	Up to 32, daisy-chain
Digital Output Resolution	1,000,000 counts per mV/V
Nonlinearity, Digital	$\pm 0.001\%$ of FS
USB Function	VCP · Firmware update
Data Field Length	16 / 32 bit

ANALOG OUTPUTS

Output Types	0–10 V · ± 10 V · 4–20 mA · ± 20 mA
Output Mapping	User-defined low / high force endpoints
Analog Resolution	0.0018% of FS
System Nonlinearity	$\pm 0.002\%$ of FS
Noise Floor	$\pm 0.001\%$ of FS
PLC Calibration Points	0 · 25 · 50 · 75 · 100%

DISCRETE I/O

Inputs	1 opto-isolated
Input Drive Voltage	10 – 30 VDC
Input Max Current	12 mA
Relay Outputs	3 Form-A, normally open
Max Switch Voltage	250 VAC / 30 VDC
Max Switch Current	5 A
Max Switch Power	150 W

CALIBRATION & UNITS

Calibration Modes	Live or Key-In
Units of Measure	lb · N · kN · g · kg · t
Positive Linearization	≤ 5 points
Negative Linearization	≤ 5 points
On-Screen Resolution	Up to 6 digits
Password Protection	Selectable

PHYSICAL & POWER

Enclosure	PA material, UL 94 V-0 rating
Protection Rating	IP20
Display	64×48 dot matrix white OLED, plus three status LEDs
Controls	4 operation buttons
Power Supply	DC 12–30 V ±10%
Power Draw	≤ 4 W · 500 mA max
Dimensions	116.7 × 100 × 25 mm [4.6 × 3.9 × 1.0 in]

ENVIRONMENT

Ambient Operating	15 to 130 °F
Storage / Operating	–22 to 140 °F
Temperature-Compensated	15 to 105 °F
Operating Humidity	10–95%, non-condensing (per IEC 60112)

All accuracy figures referenced at 68 °F. Specifications and features subject to change without notice.

TROUBLESHOOTING

WEIGHT READS OUT LOWER AT ONE END OF THE WEIGHING PLATFORM THAN THE OTHER END

- Check for any type of mechanical binding or impingement of scale platform that is displaying the lower weight.
- Check underneath the scale platform for any obstructions or foreign debris.
- Make sure that the scale feet are not screwed in so far as to restrict downward movement of the scale.
- Adjust the scale platform corners using a variable trimmer junction box (if supplied).

THE SIGNAL CONDITIONER DISPLAYS “OVER”

- The scale is overloaded. Remove weight from scale.
- Cut, damaged, loose, pinched cable between signal conditioner and platform or within platform with multiple load cells (*cabled configuration only).
- Load cell damaged on platform.
- Internal fault with signal conditioner; call Transcell Tech Support.

DISPLAY IS ERRATIC

- Check the DC power supply to ensure it is within the operating range.
- Check underneath the scale platform for any obstructions or foreign debris.

Transcell Tech Support: (847) 419-9180

Limited 12-month Warranty

This product is warranted by Transcell Technology against manufacturing defects in material and workmanship under normal use for twelve (12) months from the date of purchase. For complete warranty details and service information, please contact us at the address below.

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